Date: 7/7/03

T10:   T10 Technical Committee (SCSI)

From: Charles Binford, Sun Microsystems, Inc., (charles.binford@sun.com)
              Paul von Behren, Sun Microsystems, Inc., (paul.vonbehren@sun.com)

Subject: New Inquiry VPD Page – Management Network Address

Revision History

Revision 0 (May 7, 2003), first revision

Revision 1 (June 26, 2003), incorporate comments from T10, rework as actual SPC suggested wording

Revision 2 (July 7, 2003), incorporate comments from T10 and SNIA

Related Documents

SPC-3r13 – SCSI Primary Commands – 3, revision 13

Overview

Many storage devices are providing TCP/IP based services for management. These services may be embedded in the storage device, may be running on a separate management host bundled with the storage device, or may be running on a management host that provides a central point for management of multiple devices. Management software running elsewhere on the network needs to be able to locate these management services. This is a proposal for a VPD page that returns the address information about these management services.

This proposal is loosely related to T10 MSC. MSC proposes a standard for sending management data in-band. This proposal creates a bridge from in-band discovery to the existing out-of-band services deployed by many vendors. Note that this proposal lets a client locate out-of-band management services while MSC defines in-band management services.

The response format is loosely based on the T11 FC-GS Platform Management Address List, but provides a transport-independent interface and is available in FC configurations without switches.

Proposed SPC Change

Modify Table 266 – Vital product page codes

· *Insert Management Network Address as page code 85h.*
· *Changed the Reserved page code list to start at 86h.*
· *Adjust reference numbers accordingly.*
(changes shown with gray highlighting)

Table 266 — Vital product data page codes

Page code	VPD Page Name	Reference	Support Requirements
82h	ASCII Implemented Operating Definition	7.6.2	Optional
01h - 7Fh	ASCII Information	7.6.3	Optional
83h	Device Identification	7.6.4	Mandatory
85h	Management Network Addresses	7.6.5	Optional
81h	Obsolete	3.3.7	
84h	Software Interface Identification	7.6.6	Optional
00h	Supported VPD Pages	7.6.7	Mandatory
80h	Unit Serial Number	7.6.8	Optional
86h - AFh	Reserved		
B0h - BFh	(See specific device type)		
C0h - FFh	Vendor specific		

Modify clause numbers for 7.6.5 through 7.6.7. Adjust table numbers in remainder of document.

Insert new clause 7.6.5 as follows:

7.6.5 Management Network Addresses VPD Page
This VPD page (see table x) provides a list of network addresses of management services associated with a SCSI target device, SCSI target port, or logical unit.

Table x - Management Network Addresses VPD Page

Bit Byte	7	6	5	4	3	2	1	0
0	PERIPHERAL QUALIFIER			DEVICE TYPE				
1	PAGE CODE (85H)							
2	(MSB)							
3	PAGE LENGTH (N-3)							(LSB)
	Network services descriptor list							
4	Network service descriptor (first)							
5								
m	Network service descriptor (second)							
	.							
	.							
	.							
	Network service descriptor (last)							
n								

The PERIPHERAL QUALIFIER field and the PERIPHERAL DEVICE TYPE field are
defined in 6.4.2.

The PAGE LENGTH field specifies the length of the network services descriptor list.

Each network service descriptor contains information about one management service.
The format of the Network Service Descriptor is shown in Table x+1.

Table x+1 - Network Service Descriptor

Bit Byte	7	6	5	4	3	2	1	0
0	Reserved	ASSOCIATION		SERVICE TYPE				
1	(MSB)							
2	INTERNET PROTOCOL NUMBER							(LSB)
3	(MSB)							
4	SERVICE DESCRIPTOR LENGTH (n-4)							(LSB)
5	URL							
n								

The ASSOCIATION field specifies the entity (SCSI target device, SCSI target port, or logical unit) with which the service is associated. The values are the same as those for the ASSOCIATION field in the VPD page 83 Identification header described in table 272.

The SERVICE TYPE field allows differentiation of multiple services with the same protocol running at different port numbers or paths. For example, a device may provide separate HTTP services for configuration and diagnostics. One of these services can use the standard HTTP port 80 and the other service needs to use a non-HTTP port. The SERVICE TYPE field lets an application differentiate these two services. SERVICE TYPE values are listed in Table x+2.

Table x+2 - Network services type

00h	Unspecified
01h	Storage Configuration Service
02h	Diagnostics
03h	Status
04h	Logging
05h - 0Fh	Reserved
10h - 1Fh	Vendor-Specific

The INTERNET PROTOCOL NUMBER is a standard IETF field that defines a protocol (for example, TCP, UDP, or ICMP). This was documented in RFCs (most recent is RFC 1700), but now is in an IANA on-line database (see http://www.iana.org/assignments/protocol-numbers). Specifying the INTERNET PROTOCOL NUMBER allows URL usage to be extended to non-TCP based protocols such as UDP based SNMP. The same field is used in the iSCSI binary Ipv4 address EXTENDED COPY target descriptor format in 7.5.3.8. IETF/IANA defines this as a one-byte field; two bytes are used to allow for future growth.

The SERVICE DESCRIPTOR LENGTH specifies the length of the rest of the descriptor (the URL).

The URL field is based on the IETF URL format. It includes a protocol (e.g. http, IETF uses the term "scheme"), a host-name or IP address, an optional port number, and optional context specific information:

protocol://protocol-specific-address/context-specific-information

The protocol field includes the standard WWW protocols (http, https, ftp), but is extended to

include other services common to storage devices (ssh, snmp,...). The protocol-specific-address is typically a host name or IP address and the context-specific-information is typically a path relative to the protocol server.

The formats for the URL field are depicted in table x+3.

Table x+3 - URL field formats

Protocol (ASCII)	Protocol Specific Address	Context Specific Information
telnet	IP_address:port (note 1)	Null
ssh (notes 2,4)	IP_address:port (note 1)	Server-relative path (optional)
rsh (notes 2,4)	IP_address:port (note 1)	Server-relative path (optional)
http	IP_address:port (note 1)	Server-relative path (optional)
https (note 3)	IP_address:port (note 1)	Server-relative path (optional)
ftp	IP_address:port (note 1)	Server-relative path (optional)
tftp (note 2)	IP_address:port (note 1)	Server-relative path (optional)
snmp (note 2)	IP_address:port (note 1)	Sub-agent name (optional)
cim-xml (note 2)	IP_address:port (note 1)	Null
cim-xmls (notes 2,3)	IP_address:port (note 1)	Null
cim-soap (note 2)	IP_address:port (note 1)	Null
cim-soaps (notes 2,3)	IP_address:port (note 1)	Null

Notes

1) The port is optional. If not specified, the IANA assigned defaults apply – see http://www.iana.org/assignments/port-numbers

2) These protocols are extensions not included in the IANA registry - http://www.iana.org/assignments/uri-schemes

3) The protocols ending in 's' are the (SSL) versions of the protocols directly above in this table.

4) The ssh and rsh protocols support both remote commands and file transfer. Even though separate client applications are available (e.g. ssh, sftp, and scp), they all operate against the same service.

RFC 2732 defines the format for specifying Ipv6 addresses for the protocol-specific-address field of URLs.